

//TW Industrial Finishing



HVLP & High Solids Coatings

SBAS
National Conference

May 1999

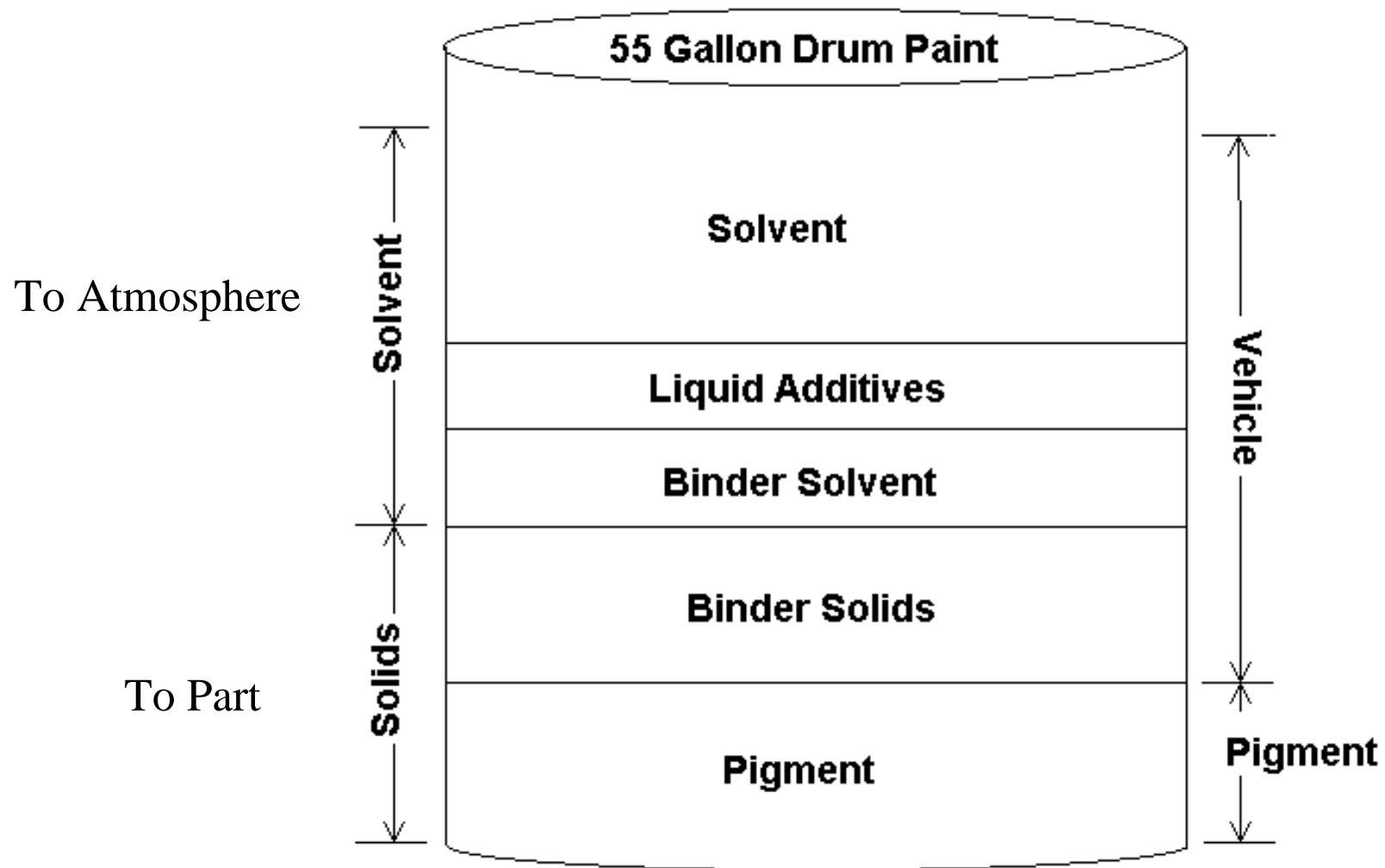
HVLP & High Solids Coatings

Introduction - The Basics

Quality Finish Factors

- ◆ **Material**
- ◆ **Operator**
- ◆ **Equipment**

Coatings



The Ideal Coating

- ◆ Hard as glass
- ◆ Flexible as rubber
- ◆ Durable as porcelain

The 60's

- ◆ Hard as glass
- ◆ Flexible as rubber
- ◆ Durable as porcelain
- ◆ Non-toxic, non-polluting
- ◆ Solvent free, non-flammable
- ◆ Apply by any means
- ◆ Air curing
- ◆ Cheap as water

The 90's

Established Quality Atomization Std.

Malvern Particle Analyzer

Measures Micron Size and Distribution of Particles
Within A Given Area

25 Microns = 1 Mil

40 Microns - Human Visibility Limit

20 Microns - “Good Finish”

Appliance, Metal Office, Auto Interior

15 To 17 Microns - “Class A” Glamour Finish

Auto Exterior, Aircraft, Bicycles, Etc.

Particle Size Relative To Equipment

20 Microns or Less

Rotary Atomization

Air spray

HVLP

20-30 Microns

HVLP Turbine

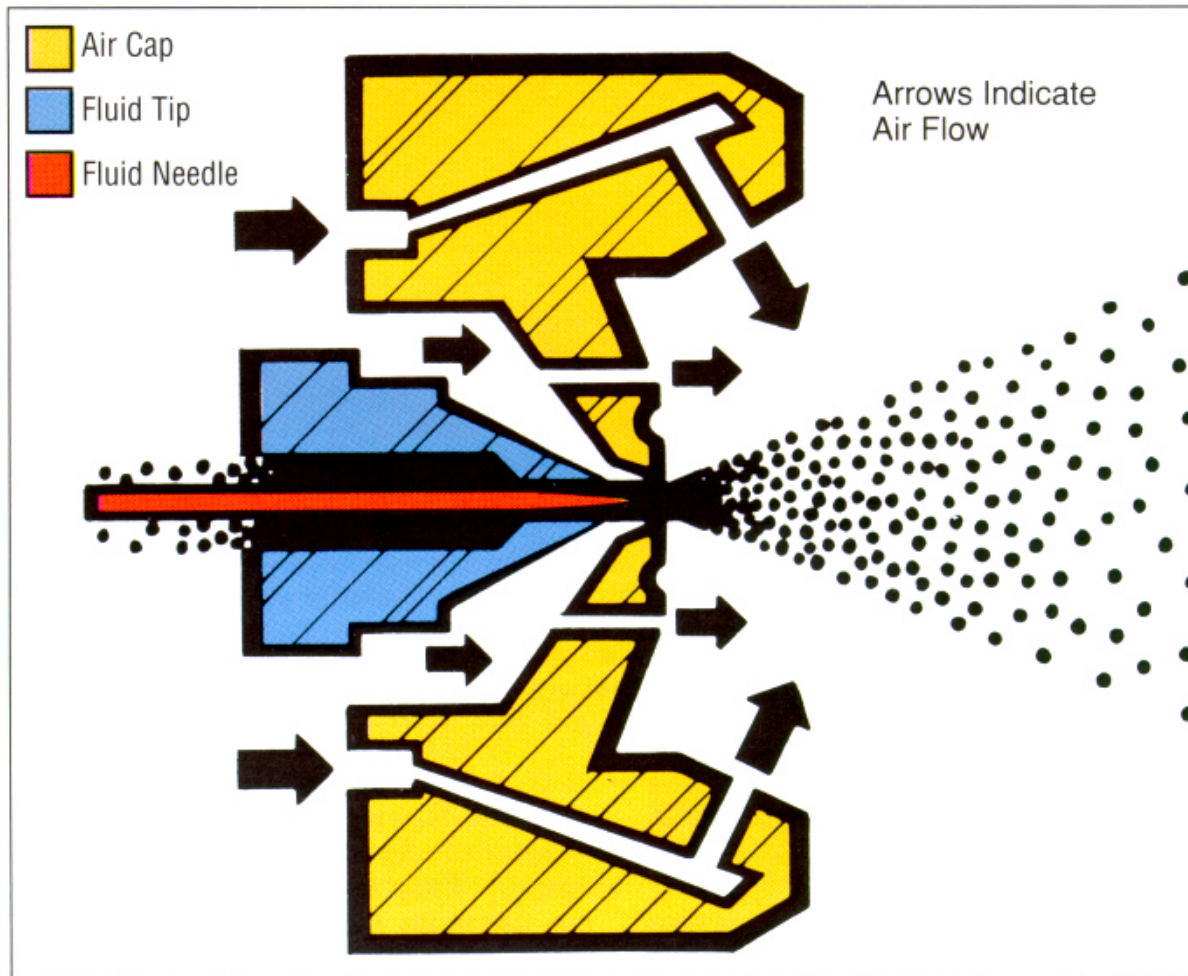
A/A Airless

Airless (Heated)

30 Microns +

Airless

Nozzle Combination

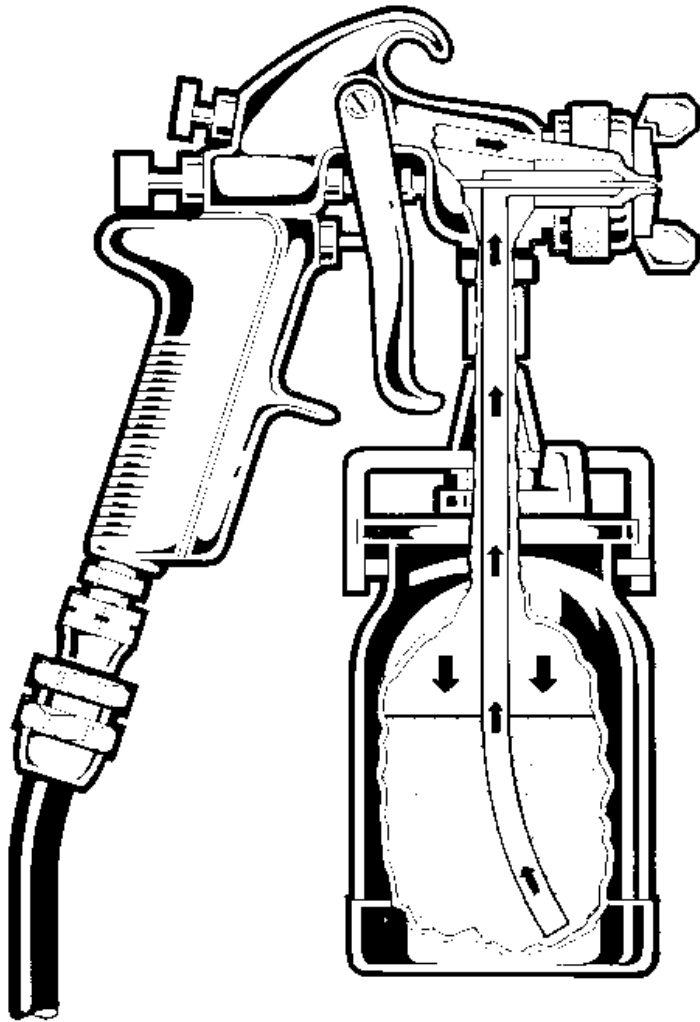


This is where atomization takes place! Air cap and fluid tip design are the key factors in atomization and transfer efficiency.

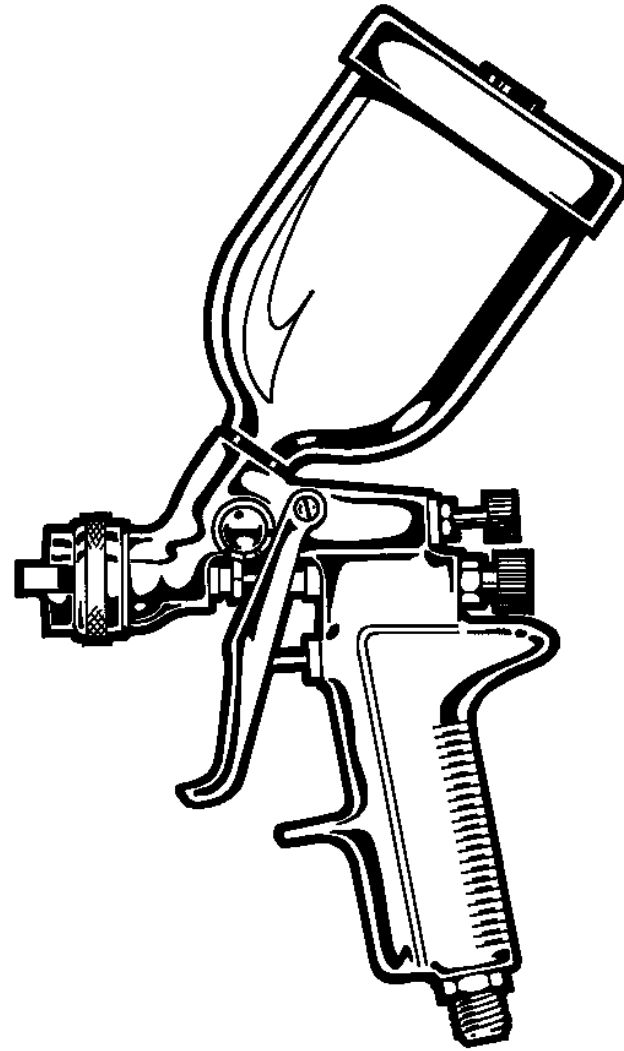
Three Ways To Feed A Spray Gun

- ◆ Suction Feed
- ◆ Gravity Feed
- ◆ Pressure Feed

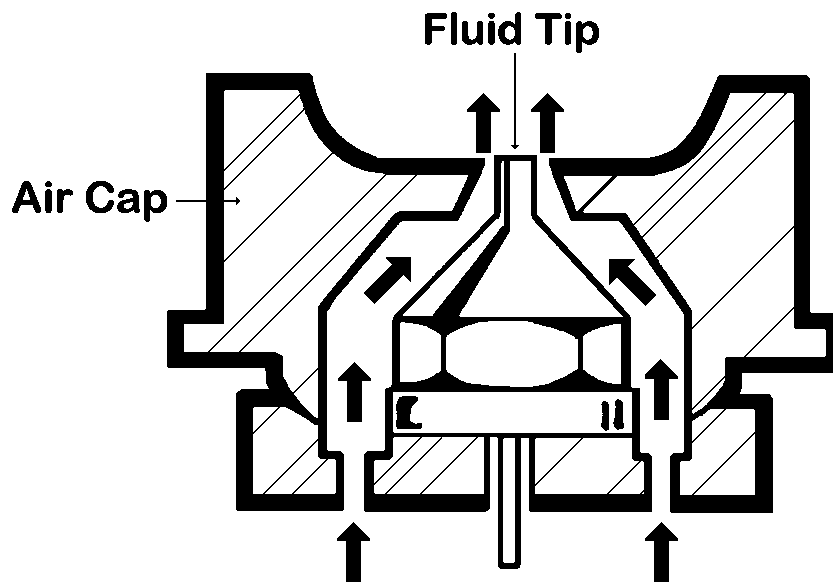
Suction Feed



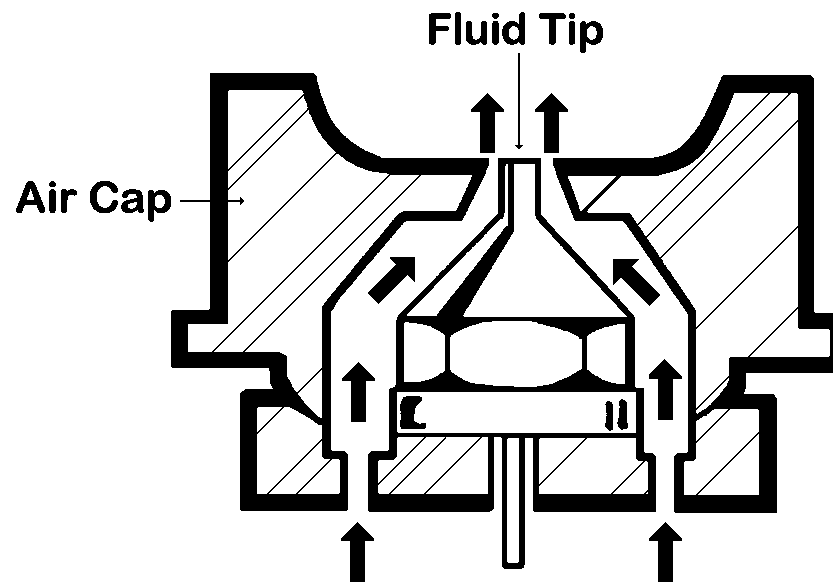
Gravity Feed



Suction Feed vs Pressure Feed Cap

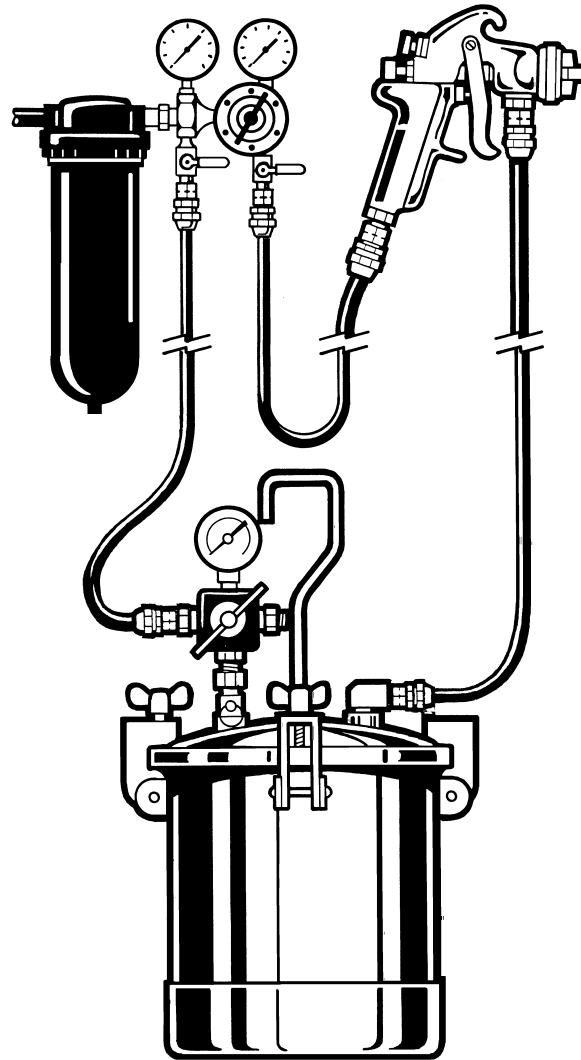


Suction

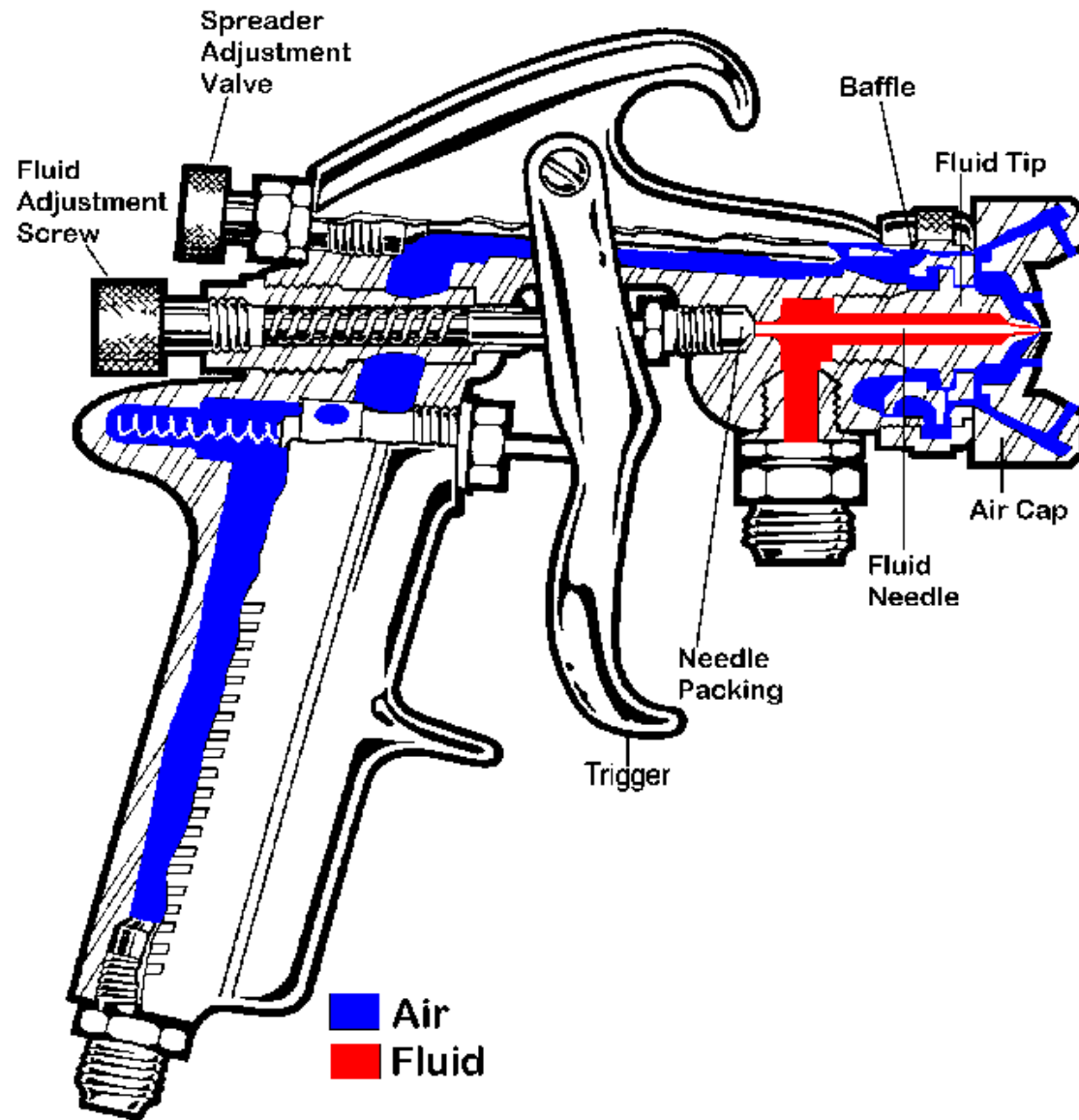


Pressure

Pressure Feed



Major Spray Gun Components



HVLP & High Solids Coatings

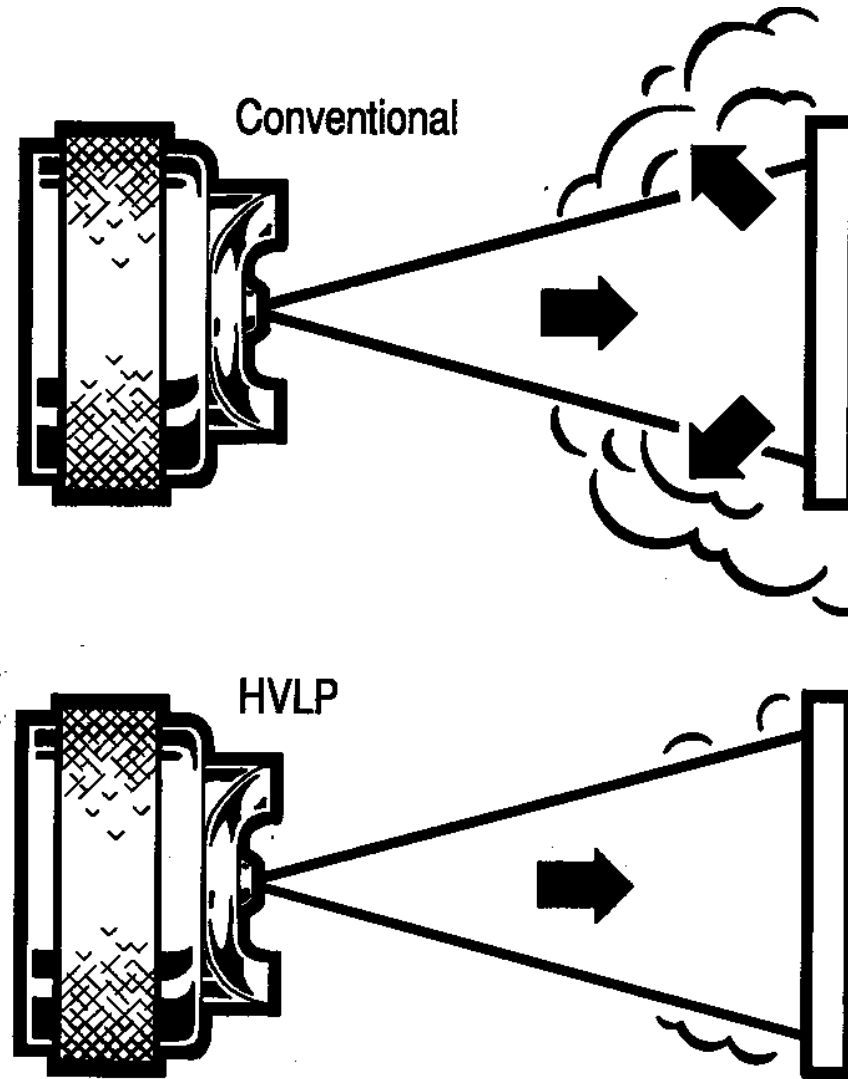
HVLP

HVLP

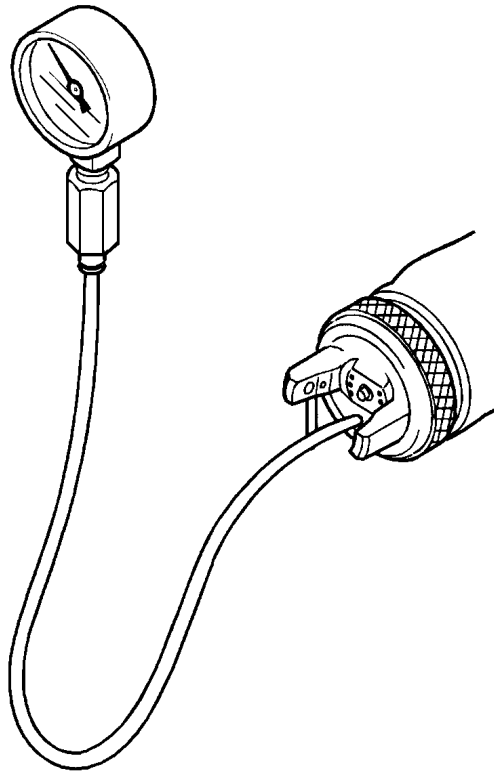
Uses High Volume Low Pressure Air
Injected Into A stream of Paint To Atomize

“Spray equipment that is used to apply coating by means of a spray gun that operates at 10.0 psig of atomizing air pressure or less at the air cap .”

HVLP vs Conventional Overspray



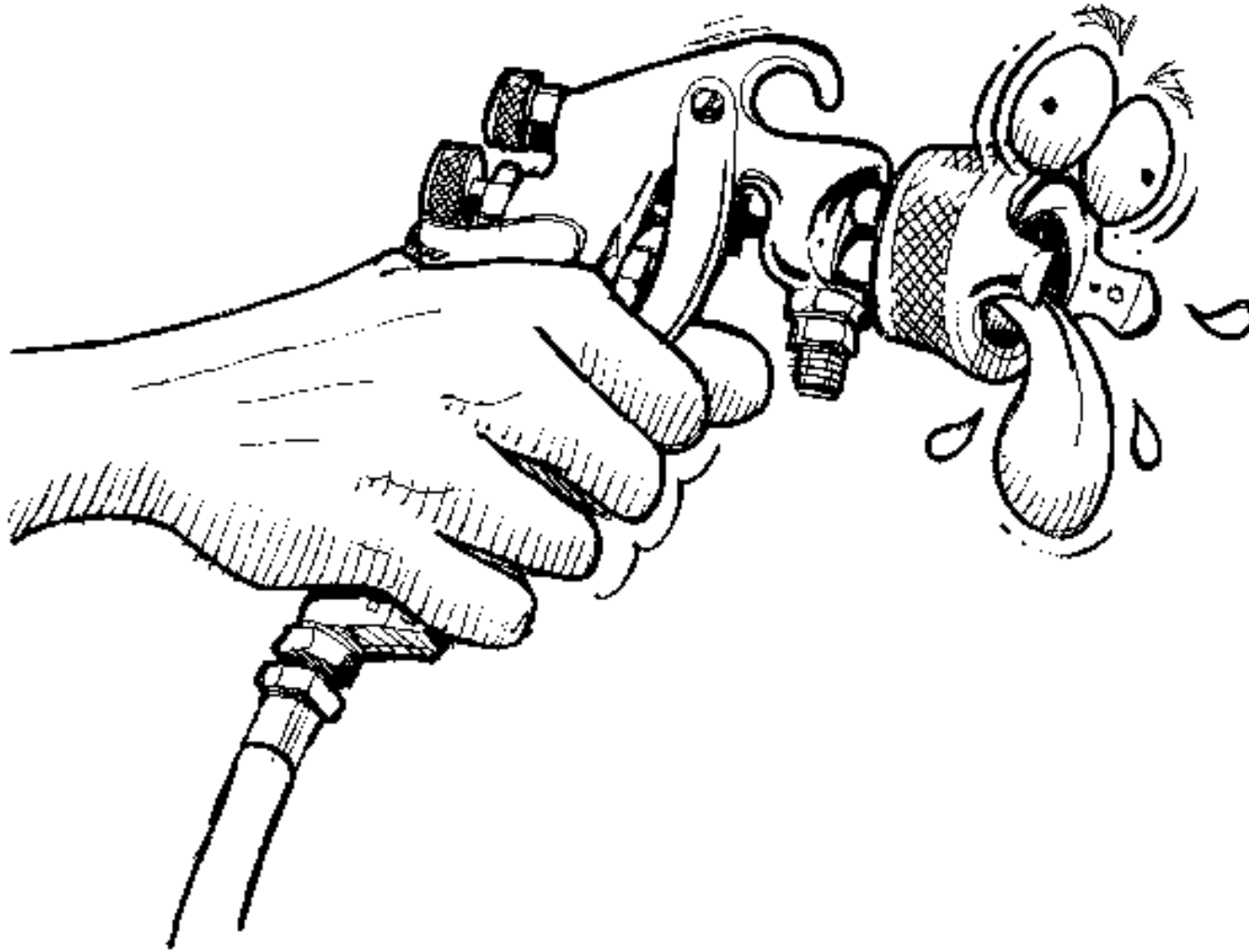
Air Cap Test Kit



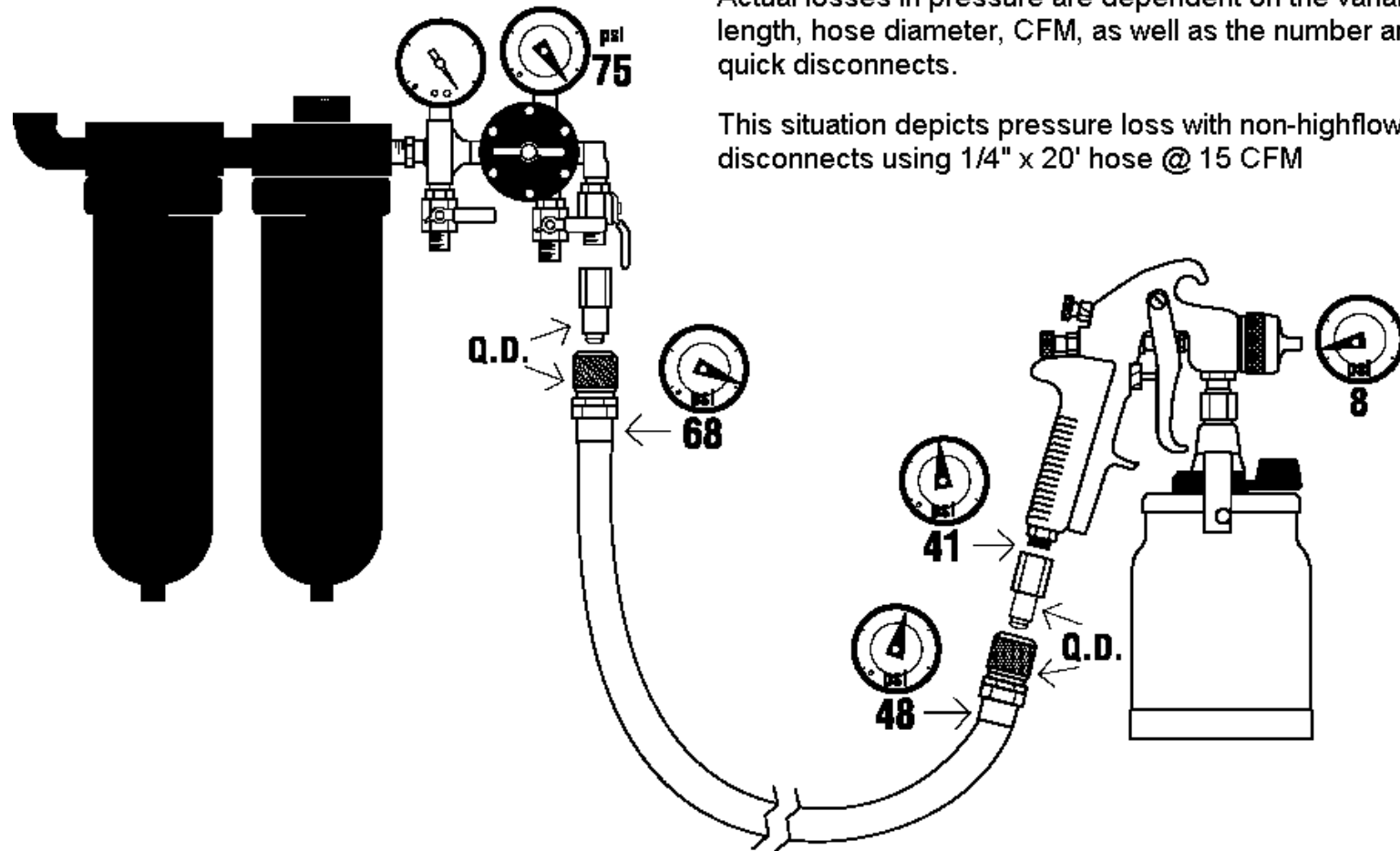
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Pressure Drop

Pressure Loss



Pressure Loss



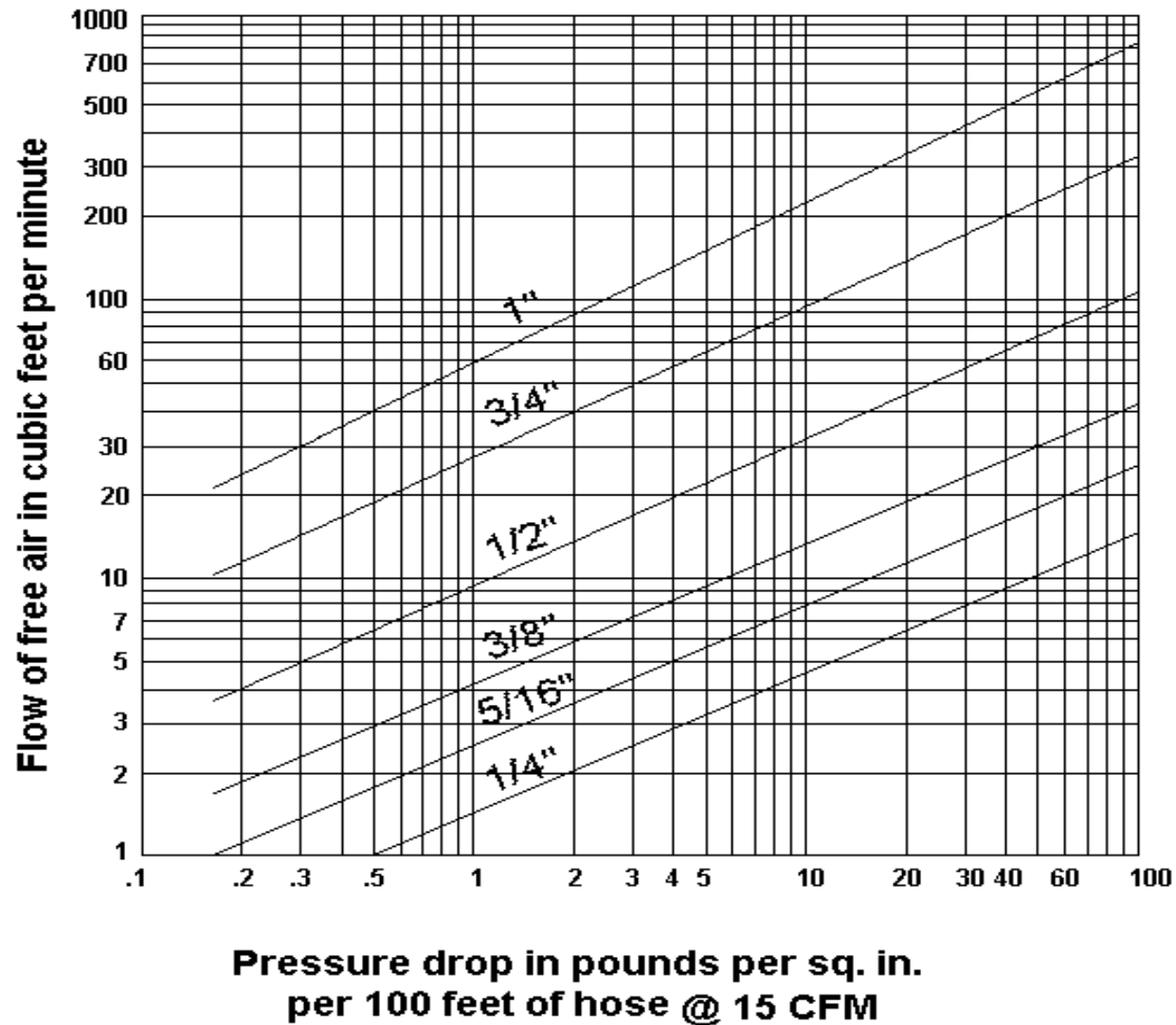
This illustration is meant to depict areas where pressure loss can occur. Actual losses in pressure are dependent on the variables of hose length, hose diameter, CFM, as well as the number and design of the quick disconnects.

This situation depicts pressure loss with non-highflow quick disconnects using 1/4" x 20' hose @ 15 CFM

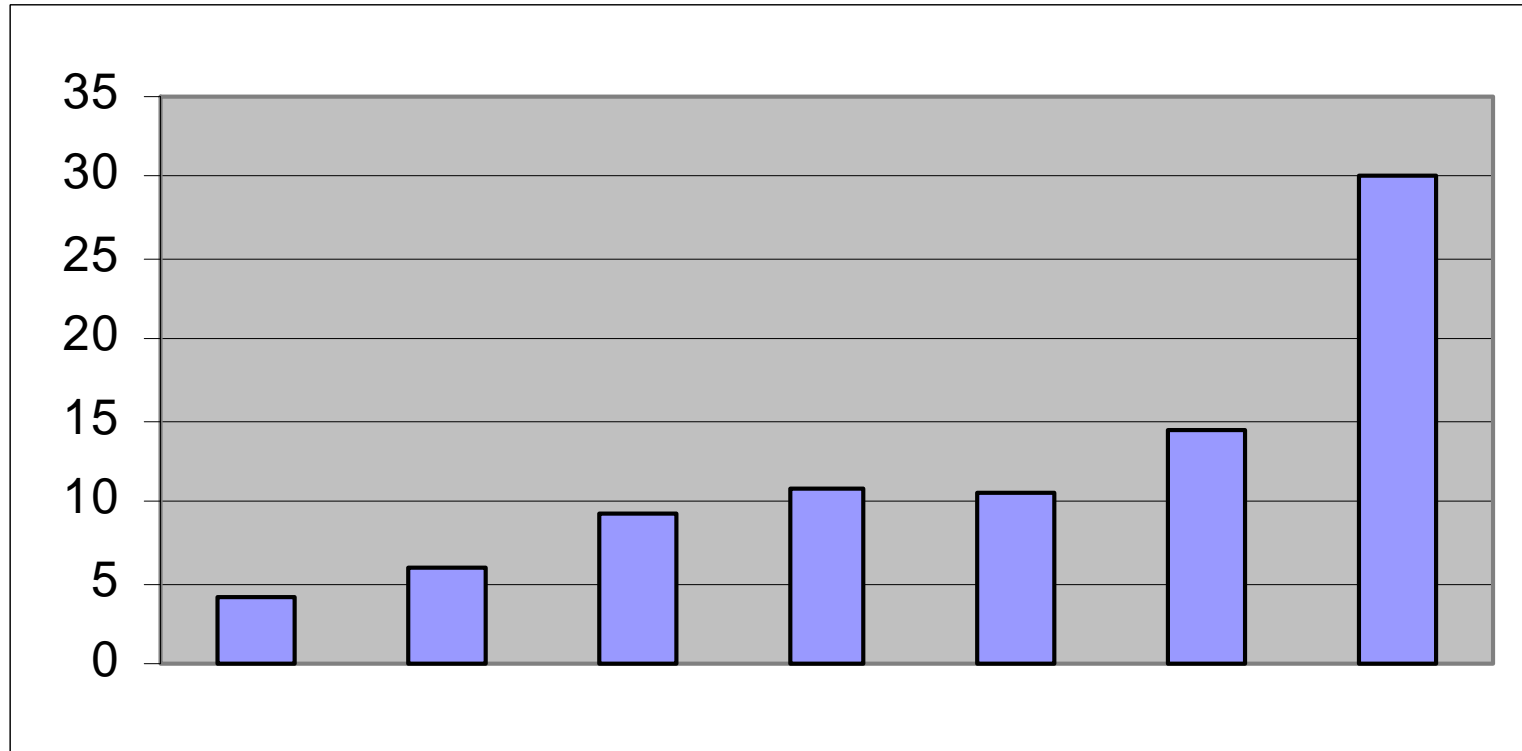
Pressure Loss - Air Hose

	15 CFM	18 CFM	20 CFM	25 CFM
1/4" X 20'	20 psi	26 psi	28 psi	34 psi
5/16" X 20'	7 psi	10 psi	12 psi	20 psi
3/8" X 20'	2.8 psi	4 psi	4.8 psi	7 psi

Pressure Loss - Air Hose



Pressure Loss - Quick Disconnects



Pressure Drop at 80 psi @ 25 SCFM

HVLP & High Solids Coatings

Pressure System Set-up

System Pressure Set-up Rule

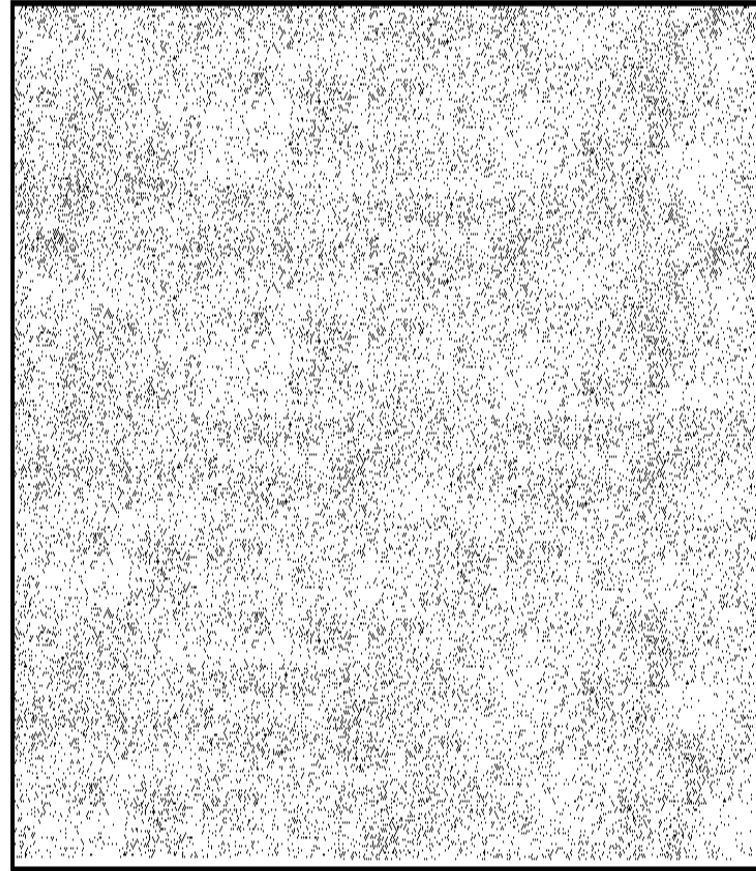
Always spray with the lowest
air and **fluid** pressures possible
while maintaining:

1. Required finish quality
2. Production requirements

System Pressure Set-up

- 1 Using control knob on fluid regulator, set fluid pressure at 5 to 10 psi.
- 2 Using control knob on air regulator, set air atomization pressure at 30-35 psi.
- 3 Spray a test pattern (fast pass) on a piece of paper, cardboard, or wood. From that test pattern, determine if the particle size is small enough and uniform throughout the pattern to achieve the required finish quality. If particle size is too large or is giving too much texture in the finish, turn the atomization pressure up in 3 to 5 psi increments until particle size and texture of finish is acceptable.

Uneven/Even Distribution (Fast pass)



System Pressure Set-up (Cont'd)

4 Spray a part with these settings. If you are not able to keep up with the production rate required or if the finish is starved for material, increase the fluid pressure (or use a larger capacity fluid tip) with the fluid regulator control knob in 2 to 4 psi increments until required wet coverage is accomplished.

5 Remember, as you turn up the fluid pressure the particle size will increase. Once the coverage required is obtained, it will be necessary to re-adjust the atomization pressure in 3 to 5 psi increments as explained in step 3 to insure required particle size and finish texture is achieved.

System Pressure Set-up (Cont'd)

6 If using HVLP, using an “Air Cap Test Kit”, verify that the air cap pressure is not above 10 psi if required by a regulatory agency.

7 After establishing the operating pressures required for production and finish quality, develop a Pressure Standardization program for your finish room to follow.

Pressure Standardization Sheet

BOOTH #: _____

MATERIAL SPRAYED: _____

CUTTING OR APPLICATION: _____

VISCOSITY _____

TYPE OF SPRAY GUN: _____

SPRAY GUN SETUP: **CAP:** _____

FLUID TIP: _____

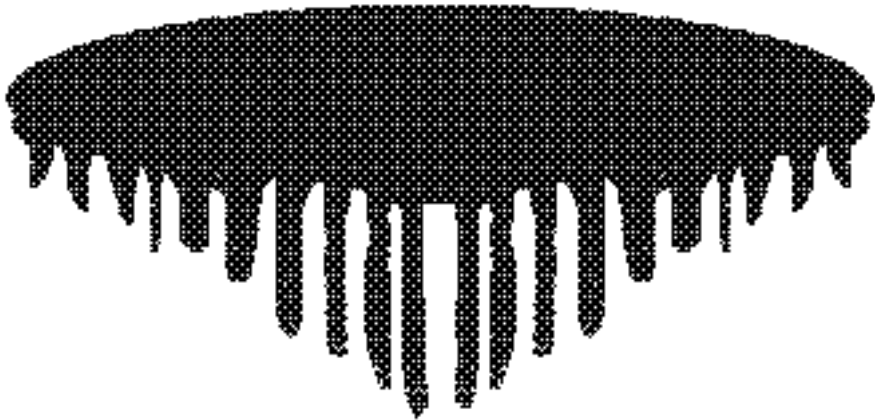
AIR PRESSURE: _____

FLUID PRESSURE: _____

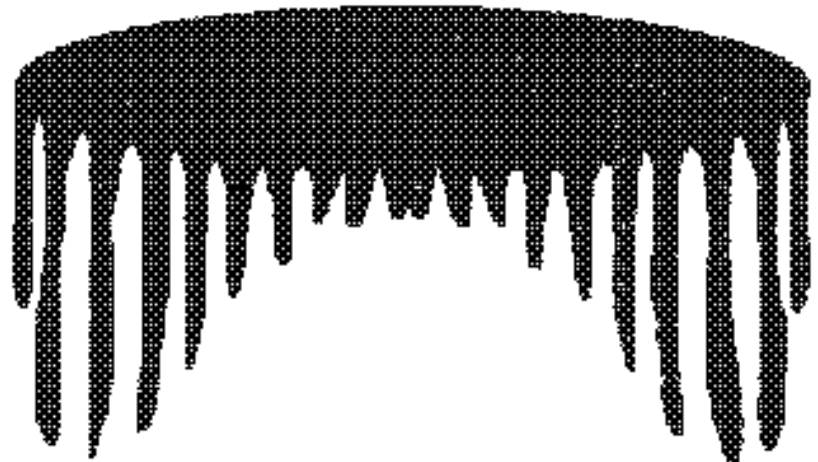
Distribution Patterns



Correct



Center Heavy



Split